

7.9 Square Root Functions and Inequalities

Square root function--a function that contains a square root of a variable

What is the inverse of $f(x) = x^2$?

$$\begin{aligned} y &= x^2 \\ x &= y^2 \\ \pm \sqrt{x} &= y \end{aligned} \quad f^{-1}(x) = \sqrt{x}$$

Graph in the real number system.

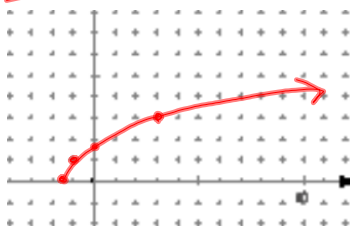
$$y = \sqrt{2x + 3}$$

$$2x + 3 \geq 0$$

$$x \geq -\frac{3}{2}$$

$$\begin{array}{r|l} x & y \\ -\frac{3}{2} & 0 \\ -1 & 1 \\ 0 & \sqrt{\frac{3}{2}} \end{array}$$

$$\begin{aligned} D: & \left[-\frac{3}{2}, +\infty\right) \\ R: & [0, +\infty) \end{aligned}$$



$$y = \sqrt{\frac{3}{2}x - 1}$$

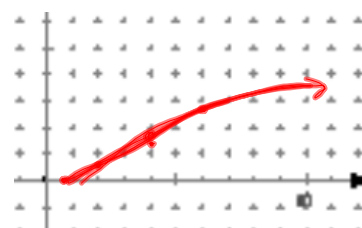
$$\frac{3}{2}x - 1 \geq 0$$

$$\frac{3}{2}x \geq 1$$

$$x \geq \frac{2}{3}$$

$$\begin{array}{r|l} x & y \\ \frac{2}{3} & 0 \\ 1 & 1 \\ 2 & \sqrt{\frac{3}{2}} \end{array}$$

$$\begin{aligned} D: & \left[\frac{2}{3}, +\infty\right) \\ R: & [0, +\infty) \end{aligned}$$



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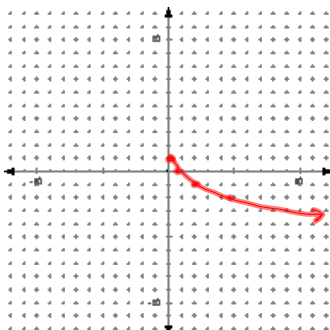
$$y = -\sqrt{2x} + 1$$

$$2x \geq 0$$

$$x \geq 0$$

x	y
0	1
$\frac{1}{2}$	0
2	-1
4.5	-2

D: $[0, +\infty)$
 R: $(-\infty, 1]$



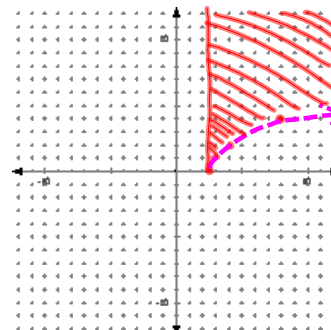
Inequalities

$$y > \sqrt{3x - 8}$$

$$3x - 8 \geq 0$$

$$x \geq \frac{8}{3}$$

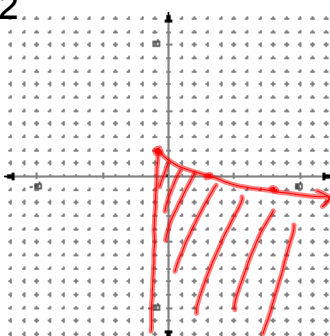
x	y
$\frac{8}{3}$	0
3	1
4	2
8	4



$$y \leq -\sqrt{x+1} + 2$$

$$x \geq -1$$

x	y
-1	2
3	0
8	-1



HW
 p398
 15-31 odd